organic compounds that show allotropic forms.——The parts of Dr. Hintze's[16] Mineralogy continue to appear with commendable rapidity. The fourth part concludes the discussion of prehnite, takes up in order axinite, harstigite, and the pyrosmalite group, and begins the treatment of the micas, which occupies one hundred-and-twenty-five pages, and is not yet finished. Although there are perhaps some omissions to be noted with respect to American occurrences, the thoroughness of the author's work cannot be gainsaid. The analyses of biotite given in the article on that mineral number 177, and those of muscovite 120, in addition to some twenty or thirty of varieties of these minerals.——Dufêt[17] describes a new method for the determination of the optical orientation and of the dispersion of the axes in triclinic minerals, and applies his method to the study of potassium bichromate.——Mr. Lane[18] illustrates a method for determining the planes in crystals in thin section. It is based in the relations existing between the zone-circles and face-points in a stereographic projection.

ZOOLOGY.

The Coloration of the Flounders.—Whoever has seen the flounders alive, or even dead but not deprived of their skin, has noticed the remarkable difference existing between the dorsal aspect exposed to the water and the ventral surface which in the living animal moves along the bottom. While the dorsal face is more or less pigmented, the ventral is white. Why is this? The school of Weismann, more Darwinian than Darwin himself, is accustomed to attribute the fact to natural selection; and the school, which is rapidly increasing, according to which the environment affects the animal, ought to attribute it to a physical influence, in view of the fact that the ventral side receives naturally much less light than the dorsal. In truth, one cannot see how natural selection could produce it. From this point of view the coloration of the ventral side seems of no importance, and if it is not one would think that it is more advantageous to the flounder to have this side gray, like the dorsal, rather than white,—that is to say, showy. Professor Cunningham, of the Marine Biological Association, has recently studied this phenomenon, and believes that it is caused by the

[16] Handbuch der Mineralogie. 4te Lief., pp. 481–640. Leipzig, 1891.
[17] Bull. Soc. Franc. d. Min., 1890, p. 341.
[18] Bull. Geol. Soc. Amer., Vol. II., 1891, p. 365.

action of the environment. He resumed his studies a short time since, and gives us the following results.

He has experimented on young flounders (*Pleuronectes flesus*), in which the eye had not yet entirely left the ventral face. Already the pigment of this face had largely disappeared; the animal swam with the left side down, and on the dorsal side the color was pronounced. Blackening the cover and sides of a glass jar, he put it with the young fish within on a support, and arranged beneath the vase a mirror in such a way as to reflect the sunlight into the vase. Now the dorsal side of the fish would be in darkness, and the ventral side exposed to the light, thus reversing the normal conditions. The water was renewed frequently, and the fish given all the food they required. Other flounders were put into a similar vase, which was normally lighted. The results were as follows:

Of thirteen fish lighted from below three only kept the usual coloration; the others showed a greater or less quantity of pigment cells and chromatophores. Under these conditions it seems probable that the absence of color from animals in normal conditions is due to the difference of circumstances, and that light is the agent which determines the development of pigment cells. It can, nevertheless, not be the only one; there exists coloration among animals living in the obscurity of profound depths.—*Revue Scientifique.*

Parmella etheridgei.—Mr. C. Hedley records a new mollusc, *Parmella etheridgei* Brazier. It was found on the stems and leaves of the palms growing on the lower ground of Lord Howe Island. It is the second species of a long-lost genus. (Records Australian Museum, Vol. I., No. 4.)

The Spawning Seasons of San Diego Fishes.—The following is a summary of observations on the spawning seasons of the San Diego fishes. Those marked with an asterisk (*) are viviparous, and the length of gestation has not in all cases been made out. The time indicated for the viviparous species is that during which young, sometimes well developed, were taken:

Heterodontus francisci, from January to April; **Squalus acanthias*, from July 20th to September; **Scylliorhinus ventriosus*, egg found ready to hatch Dec. 27th; **Galeus californicus*, September 7th to February 14th; **Triacis semifasciatus*, September 6th to October 7th; **Rhinotriacis henlei*, September 7th; **Galeorhinus zyopterus*, August 30th; *Clupea mirabilis*, December 11th to February; *Stolephorus ringens*, April, May, and June; *S. delicatissimus*, April, May, and June;

S. compressus, April 24th to July; *Tylosurus exilis*, April; *Siphostoma auliscus*, throughout the summer; *S. leptorhynchum*, throughout the summer; *Atherinopsis californiensis*, from November to March; *Atherinops affinis*, May and June; *Sphyræna argentea*, July; *Serranus maculofasciatus*, June to September; *S. nebulifer*, June to September; *Sciæna saturna*, April and May; *Genyonemus lineatus*, January; **Micrometrus aggregatus*, with young from December to May; **Holconotus argenteus*, December, January, and February; **Amphistichus argenteus*, November to March; **Ditrema laterale*, December, January, and February; **D. jacksoni*, November 7th to March; *Caulolatilus princeps*, July and August; *Typhlogobius californiensis*, May and June; *Ophiodon elongatus*, January 30th (San Francisco); **Sebastodes paucispinis*, December, January, and February; **S. flavidus*, January; **S. ovalis*, October; **S. miniatus*, November to March; **S. ruber*, July; **S. levis*, January and February; **S. rubrovinctus*, September, October, and November; **S. auriculatus*, September; **S. vexillaris*, January and February; *Oligocottus analis*, January to April; *Isesthes gentilis*, May; *I. gilbertii*, March; *Heterostichus rostratus*, March; *? Fierasfer dubius*, floating eggs procured in August from ocean's surface; *Pleuronichthys cœnosus*, pelagic eggs in April; *Hypsopsetta guttulata*, pelagic eggs in April. Descriptions and figures of most of the eggs of these have been prepared, and will be published later.—C. H. EIGENMANN, *San Francisco.*

The Pineal Eye.—Several papers have appeared in the past two years treating of this organ. Possibly those of Leydig[1] have attracted most attention. Leydig was the first to suggest that this might be a sense organ, but in these later papers he takes the ground that the pineal gland is a lymph gland, and that the "nerve cord," which has been described as connecting it with the brain, is in reality a strand of connective tissue. On account of the author's position as a histologist, these views are certainly entitled to weight, but connective tissue of ectodermal origin is certainly an anomaly. Professor A. P. W. Thomas, in an article on the development of Sphenodon,[2] states that in the recently hatched tuatara the pineal eye still shows as a dark spot through the translucent skin over the parietal foramen. This I have been able to observe even in a tuatara eight inches in length. But as the tuatara grows older the skin over the pineal eye becomes more opaque, and though in some individuals the scantier development of the pigment over the parietal foramen affords a feeble indica-

[1] *Biolog. Centralbl.*, Bd. VIII., p. 707, 1889. Ibid, Bd. X., p. 278, 1890.

[2] Proc. Royal Society, XLVIII., p. 152, 1890.

tion of the position of the eye, yet in others the pigment is deposited there as elsewhere, so that all external trace of the eye is finally lost."

Mr. W. E. Ritter has investigated the pineal eye in several lizards from the western states.[3] The species studied are *Phrynosoma douglassii*, *Ph. cornuta*, and *Uta stansburiana*, which are described at some length. The author upon morphological grounds is willing to accept the view that the organ in question was a visual structure, and that, contrary to Leydig, its function was not primarily that of a portion of the lymph system, although it may have secondarily acquired the latter character. The conclusion which one comes to after reading the literature is that the ontogeny of the whole region must be carefully followed before the question can be settled.

A Migration of Butterflies.—While sailing up the Gulf of Mexico from St. Andrew's Bay to Pensacola, Florida, on the 14th day of February last, I noticed a great many butterflies passing north. We were from five to ten miles from shore, and the butterflies all came from the south. I was at a loss to know just where they could come from, there being no land to the south nearer than Cuba and Central America. Would it be possible for them to fly such a distance? I could not procure a specimen, so cannot say what species they were; but for size and general appearance they compared quite favorably with the frittillarys. They certainly were migrating north, for hundreds passed us during the day.—A. H. Boies.

BOTANY.

Saccardo's Suggestions to Phytographists.[1]—The extensive experience which I have gained in the elaboration of my "Sylloge Fungorum" convinces me of the utility, I may say the necessity, of following in the description of plants certain oft-neglected rules. The following are recommended:

1. It is necessary that the botanist who describes with minute and involved details new species from morphological and biological standpoints should append thereto careful and comparative diagnoses

[3] Bull. Mus. Comp. Zool., XX., No. 8, 1891.

[1] Rathschläge für die Phytographen, inbesondere die Kryptogamisten. Hedwigia, Bd. XXX., Heft 1, 1891.